

TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US)  
CONCERNING A FILING UNDER 35 U.S.C. 371

6009-4611US

U S APPLICATION NO (If known see 37 CFR 1.51)

TBA 09/889942

INTERNATIONAL APPLICATION  
PCT/FI00/00054

INTERNATIONAL FILING DATE  
27 January 2000

PRIORITY DATE CLAIMED  
3 February 1999

TITLE OF INVENTION

CASTING MOULD FOR MANUFACTURING A COOLING ELEMENT AND COOLING ELEMENT IN SAID  
MOULD

APPLICANT(S) FOR DO/EO/US

LEPPANEN, Yrjo, MAKINEN, Pertti, SALMINEN, Matti

518 Rec'd PCT/FTO 25 JUL 2001

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371 (b) and PCT Articles 22 and 39 (1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
  - a. ☐ is transmitted herewith
  - b. ☒ has been transmitted by the International Bureau
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US)
6. ☐ A translation of the International application into English (35 U.S.C. 371(c)(2)) with oath
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
  - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau)
  - b. ☐ have been transmitted by the International Bureau
  - c. ☐ have not been made, however, the time limit for making such amendments has NOT expired
  - d. ☒ have not been made and will not be made
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3))
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4))
10. ☐ A copy of the annexes to the International Preliminary Examination Report under PCT Article 36 is enclosed (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern document(s) or information included.

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☐ A FIRST preliminary amendment.  
☐ A SECOND or SUBSEQUENT preliminary amendment
14. ☐ A substitute specification
15. ☐ A change of power of attorney and/or address letter
16. ☒ Other items or information:
  - Copy of Notice Informing the Applicant of the Communication of the International Application to the Designated Offices.
  - Copy of International Preliminary Examination Report
  - Copy of International Application Published Under the Patent Cooperation Treaty (PCT)  
No WO 00/45978
  - Check in the amount of \$1,000.00
  - Return postcard

TBA 09/889942

PCT/FI00/00054

6009-4611US

17. ☒ The following fees are submitted:**BASIC NATIONAL FEE** (37 CFR 1.492 (a) (1) - (5) ):

Neither international preliminary examination fee (37 CFR 1.482)  
nor international search fee (37 CFR 1.445(a)(2) paid to USPTO  
and International Search Report not prepared by the EPO or JPO.....\$1000.00

International preliminary examination fee (37 CFR 1.482) not paid to  
USPTO but International Search Report prepared by the EPO or JPO ...\$860.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO  
but international search fee (37 CFR 1.445(a)(2) paid to USPTO .....\$710.00

International preliminary examination fee paid to USPTO (37 CFR 1.482)  
but all claims did not satisfy provisions of PCT Article 33 (1) - (4).....\$690.00

International preliminary examination fee paid to USPTO (37 CFR 1.482)  
and all claims satisfied provisions of PCT Article 33(1) - (4).....\$100.00

ENTER APPROPRIATE BASIC FEE AMOUNT =

CALCULATIONS PTO USE ONLY

\$ 1,000.00

Surcharge of \$130 for furnishing the oath or declaration later than ☐20 ☐30  
months from the earliest claimed priority date (37 CFR 1.492(e)).

\$-- 0.00

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total claims	6-20	0	X \$18.00	\$ 0.00
Independent claims	1-3	0	X \$80.00	\$-- 0.00

MULTIPLE DEPENDENT CLAIM(S) (if applicable) + \$270.00 \$ 0.00

**TOTAL OF ABOVE CALCULATIONS =** \$ 1,000.00

Reduction of 1/2 for filing by small entity, if applicable. A Small Entity Statement  
must also be filed (Note 37 CFR 1.9, 1.27, 1.28). Applicant asserts it is a SMALL ENTITY. \$ 00.00

**SUBTOTAL =** \$ 1,000.00

Processing fee of \$130.00 for furnishing the English translation later than ☐20 ☐30  
months from the earliest claimed priority date (37 CFR 1.492(f)). + \$-- 0.00

**TOTAL NATIONAL FEE =** \$ 0.00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be  
accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property = \$ 00.00

**TOTAL FEES ENCLOSED** \$ 1,000.00

Amount to be refunded:	\$
charged	\$

- a. ☒ A check in the amount of \$1,000.00 cover the above fees is enclosed.
- b. ☐ Please charge my Deposit Account No. 13-4500 in the amount of to cover the above fees.
- c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 13-4500, ORDER NO. 0558-4611US. A duplicate copy of this sheet is enclosed.

**NOTE:** Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

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345 Park Avenue  
New York, NY 10154-0053  
Telephone: 212-758-4800  
Telecopier: 212-751-6849

Israel Blum

Registration Number 26,710

2/PRTS

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09/889942  
JC17 Rec'd PCT/PTO 25 JUL 2001

CASTING MOULD FOR MANUFACTURING A COOLING ELEMENT AND  
COOLING ELEMENT MADE IN SAID MOULD

The invention relates to a casting mould for the manufacturing of a cooling  
5 element for a pyrometallurgical reactor, wherein the casting mould is at least  
partly cooled and lined with a material that can withstand high temperatures.  
The invention also relates to the cooling element made in the said mould.

In pyrometallurgical processes, the brickwork of a reactor is protected by  
10 water-cooled cooling elements so that, due to the cooling effect, the heat  
coming to the surface of the brickwork is transferred via the cooling element  
to water, wherein the wear on the lining decreases considerably in  
comparison with a reactor not provided with cooling. The decrease in wear  
15 is caused by the result of cooling, a so-called autogenic lining, formed of slag  
and other molten phases that attaches to the fireproof surface of the lining.

Traditionally, cooling elements are manufactured by two methods: Firstly, the  
elements can be fabricated by sand casting. In this method, cooling pipes  
made of highly thermo-conductive material such as copper are set in a  
20 mould dug in the sand, so that during casting, there is cooling either by air or  
water occurring around the pipes. The element to be cast around the piping  
is also made of a highly thermo-conductive material, advantageously copper.  
This fabrication method has been described in for example GB patent  
1386645. The problem with this method is the uneven attachment of the  
25 piping that acts as flow channel to the surrounding casting material, since  
part of the piping may be totally detached from the element cast around it  
and part of the piping may be completely melted and therefore damaged. If  
no metallic bond is formed between the cooling pipe and the other element  
cast around it, heat transfer will not be efficient. If the piping melts  
30 completely, it will prevent the flow of cooling water. The casting properties of  
the casting material can be enhanced by, for example, mixing some  
phosphorus into the copper, which will improve the metallic bond forming

between the piping and casting material, but in this way the heat transfer properties (thermal conductivity) of the cast copper deteriorate considerably with just small additions. Advantages of this method can be listed as the comparatively low fabrication costs and independence from dimensions.

5

A fabrication method has also been used, where glass piping in the shape of a flow channel is set into the cooling element mould which glass piping is broken after casting, so that a flow channel forms inside the element.

- 10 US patent 4382585 describes another, widely used fabrication method for cooling elements, according to which the element is fabricated for example from rolled copper plate, by machining the necessary channels. The advantage of this method is the dense, strong structure and good heat transfer from a cooling medium such as water to the element. The
- 15 drawbacks are dimensional limitations (size) and the high cost.

- Now a casting mould has been developed for manufacturing a cooling element for a pyrometallurgical reactor to replace the previous sand casting. The casting mould is constructed from separate, highly thermo-conductive
- 20 copper plates, of which at least some are water-cooled. Since the cooling element itself is in most cases copper, the construction plates of the casting mould should be isolated from the cast copper, and this occurs by lining the inner part of the mould with highly thermo-conductive material such as graphite plate, so that the parts of the mould attach themselves to the
- 25 surface by means of underpressure. Graphite prevents the melt poured into the mould from sticking to the surface of the mould. The cooling element casting mould is advantageously provided with a cope, so the casting can be done in shielding gas. Prior to casting, the cooling pipes necessary for cooling water circulation that are going to go inside the cooling element are
- 30 placed into the mould. This piping is preferably made of nickel copper pipe, because the melting point of Ni-Cu pipe is higher than the copper being cast around it and therefore there is no risk of the pipe melting during casting.

The essential features of the invention will become apparent in the attached patent claims.

The casting mould construction described in this invention offers the following advantages:

- Thanks to the cooled mould and graphite lining, a tight and fine-grained casting is formed, particularly at the base of the casting mould.
- The construction of the mould means that the cooling element forms a smooth surface, which is not vulnerable to corroding smelting conditions.

The nickel copper used as the material for the cooling element cooling pipes facilitates a good welding of the piping to the actual element.

The construction of the casting mould can be developed further so that it can also be used for manufacturing cooling elements designed for special purposes. This occurs for example by adding graphite or fireproof shaped pieces to the mould, so that the finished element design differs correspondingly from the plated version.

The invention can be described further with the aid of the attached diagrams, where Figure 1 presents a principle drawing of the casting mould according to this invention and

Figure 2 shows the casting mould in cross-section, with which special-purpose cooling elements can be cast.

Figure 1 shows a principle drawing of a cooling element casting mould 1. The mould is composed of a mould base plate 2, which is furnished with cooling pipes 3. The mould also has side walls 4 and 5 and end walls from which only a back wall 6 is shown in the drawing. In the drawing, only the base plate is furnished with cooling pipes but, if required, the side and end walls can also be equipped for cooling. The front end wall has been left out

of the drawing for reasons of clarity, although it definitely belongs to the mould.

5 The inside of the mould is lined with graphite plates 7. The cooling element cooling pipes 8, which are advantageously made of nickel copper, are supported inside the mould. The mould is also equipped with a cope (not shown) so that shielding gas can be used to prevent oxidation of the element to be cast.

10 In Figure 2 it can be seen that shaped pieces 9 can be placed on the base of the mould, which are made of graphite or some other fireproof material. By means of these shaped pieces, the side 11, which will come into contact with mould base 2 of cooling element 10, can be shaped as desired.

## PATENT CLAIMS

1. A casting mould formed of base (2), wall (4,5) and end plates (6) for manufacturing of a pyrometallurgical reactor cooling element,  
5 **characterized in that** the casting mould (1) made of copper plates is at least partly equipped with cooling pipes (3) and that the mould is lined on the inside with a plate (7) resistant to high temperatures.
2. A casting mould according to claim 1, **characterized in that** the casting  
10 mould (1) is lined with graphite plates (7).
3. A casting mould according to claim 1, **characterized in that** the plates  
(7) resistant to high temperatures are fixed to the surface of the mould (1)  
15 by means of underpressure.
4. A casting mould according to claim 1 **characterized in that** shaped  
pieces (9) made of graphite or fire-resistant material are placed on the  
base of the casting mould (1).
- 20 5. A pyrometallurgical reactor cooling element fabricated in a mould,  
**characterized in that** cooling pipes (8), placed inside cooling element  
(10) are manufactured of nickel copper.
- 25 6. A cooling element according to claim 5, **characterized in that** during  
manufacturing of the cooling element (10), one side of the element (11) is  
formed by means of shaped pieces (9) placed on the base of the casting  
mould.

**ABSTRACT**

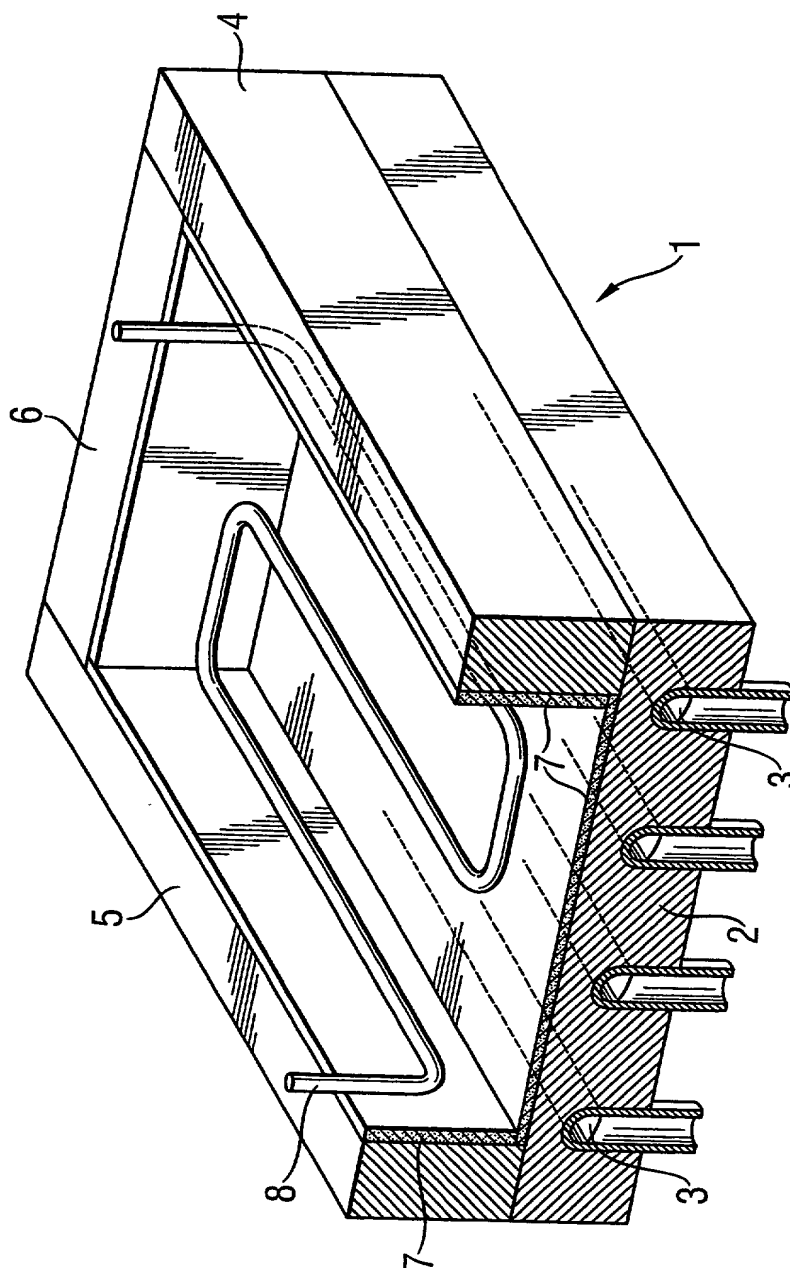
The invention relates to a casting mould for manufacturing of a cooling element for a pyrometallurgical reactor, wherein the casting mould is at least partly cooled and lined with a material that can withstand high temperatures. The invention also relates to the cooling element made in the mould, inside which cooling pipes made of nickel copper are placed during fabrication.

(FIG. 1)

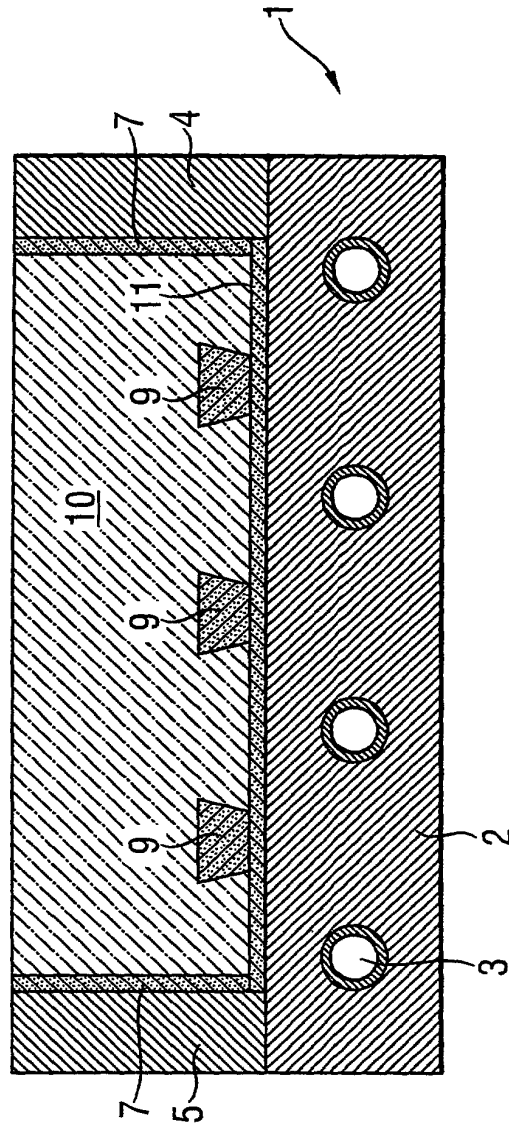
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1/2



**Fig. 1**



**Fig. 2**

212, 12 52  
Docket No. \_\_\_\_\_

COMBINED DECLARATION AND POWER OF ATTORNEY FOR  
ORIGINAL, DESIGN, NATIONAL STAGE OF PCT, SUPPLEMENTAL  
DIVISIONAL, CONTINUATION OR CONTINUATION-IN-PART APPLICATION

As a below name inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Casting mould for manufacturing a cooling element and cooling  
the specification of which \_\_\_\_\_ element made in said mould

- a. ☐ is attached hereto
- b. ☐ was filed on \_\_\_\_\_ as application Serial No. \_\_\_\_\_ and was amended on \_\_\_\_\_ (if applicable).

PCT FILED APPLICATION ENTERING NATIONAL STATE

- c. ☒ was described and claimed in International Application No. PCT/FI00/00054 filed on \_\_\_\_\_ and as amended on \_\_\_\_\_ (if any). 27 Jan 2000

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).

I hereby specify the following as the correspondence address to which all communications about this application are to be directed:

SEND CORRESPONDENCE TO: MORGAN & FINNEGAN, L.L.P  
345 Park Avenue  
New York, N.Y. 10154

DIRECT TELEPHONE CALLS TO: \_\_\_\_\_  
(212) 758-4800

☐ I hereby claim foreign priority benefits under Title 35, United States Code § 119(a)-(d) or under § 365(b) of any foreign application(s) for patent or inventor's certificate or under § 365(a) of any PCT international application(s) designating at least one country other than the U.S. listed below and also have identified below such foreign application(s) for patent or inventor's certificate or such PCT international application(s) filed by me on the same subject matter having a filing date within twelve (12) months before that of the application on which priority is claimed:

☐ The attached 35 U.S.C. § 119 claim for priority for the application(s) listed below forms a part of this declaration.

Country/PCT	Application Number	Date of filing (day, month, yr)	Date of Issue (day, month, yr)	Priority Claimed
Finland	19990198	03.02.1999		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
				<input type="checkbox"/> YES <input type="checkbox"/> NO
				<input type="checkbox"/> YES <input type="checkbox"/> NO

☐ I hereby claim the benefit under 35 U.S.C. § 119(e) of any U.S. provisional application(s) listed below.

Provisional Application No. Date of Filing (day, month, yr)

**ADDITIONAL STATEMENTS FOR DIVISIONAL, CONTINUATION OR CONTINUATION-IN-PART OR PCT INTERNATIONAL APPLICATION(S) (DESIGNATING THE U.S.)**

I hereby claim the benefit under Title 35, United States Code § 120 of any United States application(s) or under § 365(c) of any PCT international application(s) designating the U.S. listed below.

US/PCT Application Serial No.	Filing Date	Status (patented, pending, abandoned)/ U.S. application no. assigned (For PCT)
US/PCT Application Serial No.	Filing Date	Status (patented, pending, abandoned)/ U.S. application no. assigned (For PCT)

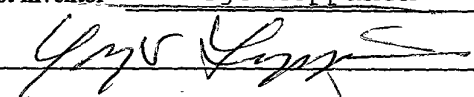
☐ In this continuation-in-part application, insofar as the subject matter of any of the claims of this application is not disclosed in the above listed prior United States or PCT international application(s) in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application.

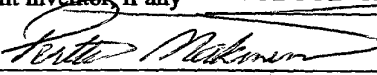
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or Imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

I hereby appoint the following attorneys and/or agents with full power of substitution and revocation, to prosecute this application, to receive the patent, and to transact all business in the Patent and Trademark Office connected therewith: John A. Diaz (Reg. No. 19,550), John C. Vassil (Reg. No. 19,098), Alfred P. Ewert (Reg. No. 19,887), David H. Pfeffer (Reg. No. 19,825), Harry C. Marcus (Reg. No. 22,390), Robert E. Paulson (Reg. No. 21,046), Stephen R. Smith (Reg. No. 22,615), Kurt E. Richter (Reg. No. 24,052), J. Robert Dailey (Reg. No. 27,434), Eugene Moroz (Reg. No. 25,237), John F. Sweeney (Reg. No. 27,471), Arnold I. Rady (Reg. No. 26,601), Christopher A.

Hughes (Reg. No. 26,914), William S. Feiler (Reg. No. 26,728), Joseph A. Calvaruso (Reg. No. 28,287), James W. Gould (Reg. No. 28,859), Richard C. Komson (Reg. No. 27,913), Israel Blum (Reg. No. 26,710), Bartholomew Verdirame (Reg. No. 28,483), Maria C.H. Lin (Reg. No. 29,323), Joseph A. DeGirolamo (Reg. No. 28,595), Michael A. Nicodema (Reg. No. 33,199), Michael P. Dougherty (Reg. No. 32,730), Seth J. Atlas (Reg. No. 32,454), Andrew M. Riddles (Reg. No. 31,657), Bruce D. DeRenzi (Reg. No. 33,676), Michael M. Murray (Reg. No. 32,537), Mark J. Abate (Reg. No. 32,527), Alfred L. Haffner, Jr. (Reg. No. 18,919), Harold Haidt (Reg. No. 17,509), John T. Gallagher (Reg. No. 35,516), Steven F. Meyer (Reg. No. 35,613) and Kenneth H. Sonnenfeld (Reg. No. 33,285) of Morgan & Finnegan, L.L.P. whose address is: 345 Park Avenue, New York, New York, 10154; and Edward A. Pennington (Reg. No. 32,588), Michael S. Marcus (Reg. No. 31,727) and John E. Hoel (Reg. No. 26,279) of Morgan & Finnegan, L.L.P., whose address is 1775 Eye Street, Suite 400, Washington, D.C. 20006.

☒ I hereby authorize the U.S. attorneys and/or agents named hereinabove to accept and follow instructions from Outokumpu Oy, Epoo, Finland as to any action to be taken in the U.S. Patent and Trademark Office regarding this application without direct communication between the U.S. attorneys and/or agents and me. In the event of a change in the person(s) from whom instructions may be taken I will so notify the U.S. attorneys and/or agents hereinabove.

1-00  
Full name of sole or first inventor Yrjö Leppänen  
Inventor's signature\*  24 August 2001  
date  
Residence Mikonkatu 30 A 25, Pori, Finland  
Citizenship Finnish FTX  
Post Office Address Mikonkatu 30 A 25, FIN-28100 Pori, Finland

2-00  
Full name of second joint inventor, if any Pertti Mäkinen  
Inventor's signature\*  24 August 2001  
date  
Residence Suulotintie 35, Pori, Finland  
Citizenship Finnish FTX  
Post Office Address Suulotintie 35, FIN-28610 Pori, Finland

☒ ATTACHED IS ADDED PAGE TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR SIGNATURE BY THIRD AND SUBSEQUENT INVENTORS FORM.

\* Before signing this declaration, each person signing must:

1. Review the declaration and verify the correctness of all information therein; and
2. Review the specification and the claims, including any amendments made to the claims.

After the declaration is signed, the specification and claims are not to be altered.

ADDED PAGE TO COMBINED DECLARATION  
AND POWER OF ATTORNEY FOR  
SIGNATURE BY THIRD AND SUBSEQUENT INVENTOR

3-00  
Full name of third joint inventor, if any Matti Salminen  
Inventor's signature\* *Matti Salminen* 24 August 2001  
date  
Residence Ahjonkatu 9, Nakkila, Finland  
Citizenship Finnish FIX  
Post Office Address Ahjonkatu 9, FIN-20250 Nakkila, Finland

Full name of fourth joint inventor, if any \_\_\_\_\_  
Inventor's signature\* \_\_\_\_\_  
date  
Residence \_\_\_\_\_  
Citizenship \_\_\_\_\_  
Post Office Address \_\_\_\_\_

Full name of fifth joint inventor, if any \_\_\_\_\_  
Inventor's signature\* \_\_\_\_\_  
date  
Residence \_\_\_\_\_  
Citizenship \_\_\_\_\_  
Post Office Address \_\_\_\_\_

\* Before signing this declaration, each person signing must:

1. Review the declaration and verify the correctness of all information therein; and
2. Review the specification and the claims, including any amendments made to the claims.

After the declaration is signed, the specification and claims are not to be altered.

To the inventor(s):

The following are cited in or pertinent to the declaration attached to the accompanying application:

Title 37, Code of Federal Regulation, § 1.56

Duty to disclose information material to patentability.

(a) A patent by its very nature is affect with a public interest. The public interest is best served, and the most effective patent examination occurs when, at the time an application is being examined, the Office is aware of and evaluates the teachings of all information material to patentability. Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section. The duty to disclose information exists with respect to each pending claim until the claim is canceled or withdrawn from consideration, or the application becomes abandoned. Information material to the patentability of a claim that is canceled or withdrawn from consideration need not be submitted if the information is not material to the patentability of any claim remaining under consideration in the application. There is no duty to submit information which is not material to the patentability of any existing claim. The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in patent was cited by the Office or submitted to the Office in the manner prescribed by §§1.97(b)-(d) and 1.98. However, no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. The Office encourages applicants to carefully examine:

- (1) prior art cited in search reports of a foreign patent office in a counterpart application, and
- (2) the closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.

Title 35, U.S. Code § 101

Inventions patentable

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Title 35 U.S. Code § 102

Conditions for patentability; novelty and loss of right to patent

A person shall be entitled to a patent unless --

- (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent,
- (b) the invention was patented or described in a printed publication in this or foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States, or

(c) he has abandoned the invention, or

(d) the invention was first patented or caused to be patented, or was the subject of an inventor's certificate, by the applicant or his legal representatives or assigns in a foreign country prior to the date of the application for patent in this country on an application for patent or inventor's certificate filed more than twelve months before the filing of the application in the United States, or

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent, or

(f) he did not himself invent the subject matter sought to be patented, or

(g) before the applicant's invention thereof the invention was made in this country by another had not abandoned, suppressed, or concealed it. In determining priority of invention there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other ...

#### Title 35, U.S. Code § 103

##### Conditions for patentability; non-obvious subject matter

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

#### Title 35, U.S. Code § 112 (in part)

##### Specification

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise and exact terms also enable any person skilled in the art to which it pertains, or with which it is mostly nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

#### Title 35, U.S. Code § 119

##### Benefit of earlier filing date in foreign country; right of priority

An application for patent for an invention filed in this country by any person who has, or whose legal representatives or assigns have, previously regularly filed an application for a patent for the same invention in a foreign country which affords similar privileges in the case of applications filed in the United States or to citizens of the United States, shall have the same effect as the same application would have if filed in this country on the date on which the application for patent for the same invention was first filed in such foreign country, if the application in



this country is filed within twelve months from the earliest date on which such foreign application was filed; but no patent shall be granted on any application for patent for an invention which had been patented or described in a printed publication in any country more than one year before the date of the actual filing of the application in this country, or which had been in public use or on sale in this country more than one year prior to such filing.

Title 35, U.S. Code § 120

**Benefit or earlier filing date in the United States**

An application for patent for an invention disclosed in the manner provided by the first paragraph of section 112 of this title in an application previously filed in the United States, or as provided by section 363 of this title, which is filed by an inventor or inventors named in the previously filed application shall have the same effect, as to such invention, as though filed on the date of the prior application, if filed before the patenting or abandonment of or termination of proceedings on the first application or an application similarly entitled to the benefit of the filing date of the first application and if it contains or is amended to contain a specific reference to the earlier filed application.

Please read carefully before signing the Declaration attached to the accompanying Application.

If you have any questions, please contact Morgan & Finnegan, L.L.P.

FORM:COMB-DEC.NY  
Rev. 5/21/98